

# RECTIFIERS

## High Efficiency, 25 A

UES701 BYW31-50 BYW77-50  
UES702 BYW31-100 BYW77-100  
UES703 BYW31-150 BYW77-150

### FEATURES

- Low Forward Voltage
- Very Fast Switching
- Low Thermal Resistance
- High Surge Capability
- Mechanically Rugged
- Both Polarities Available

### DESCRIPTION

Designed to meet the efficiency demand of switching type power supplies, these devices are useful in many switching applications.

The low thermal resistance and forward voltage drop of this series allows the user to replace DO-5 size devices in many applications.

### ABSOLUTE MAXIMUM RATINGS

|                                                            | UES701          | UES702 | UES703 |
|------------------------------------------------------------|-----------------|--------|--------|
| Peak Inverse Voltage, $V_R$                                | 50V             | 100V   | 150V   |
| Repetitive Peak Inverse Voltage, $V_{RRM}$                 | 50V             | 100V   | 150V   |
| Non-Repetitive Peak Inverse Voltage, $V_{RSM}$             | 50V             | 100V   | 150V   |
| Maximum Average D.C. Output Current $I_o$ @ $T_C$          | 25A @ 100°C     |        |        |
| RMS Forward Current, $I_F$ (RMS)                           | 40A             |        |        |
| Non-Repetitive Sinusoidal Surge Current (8.3ms), $I_{FSM}$ | 400A            |        |        |
| Thermal Resistance, Junction to Case, $R_{\theta JC}$      | 1.5°C/W         |        |        |
| Storage Temperature Range, $T_{STG}$                       | -55°C to +175°C |        |        |
| Maximum Operating Junction Temperature, $T_{J MAX}$        | +175°C          |        |        |

### ABSOLUTE MAXIMUM RATINGS

|                                                                        | BYW31-50        | BYW31-100 | BYW31-150 | BYW77-50        | BYW77-100 | BYW77-150 |
|------------------------------------------------------------------------|-----------------|-----------|-----------|-----------------|-----------|-----------|
| Peak Inverse Voltage, $V_R$                                            | 50V             | 100V      | 150V      | 50V             | 100V      | 150V      |
| Repetitive Peak Inverse Voltage, $V_{RRM}$                             | 50V             | 100V      | 150V      | 50V             | 100V      | 150V      |
| Non-Repetitive Peak Inverse Voltage, $V_{RSM}$                         | 50V             | 100V      | 150V      | 50V             | 100V      | 150V      |
| Maximum Average D.C. Output Current, $I_o$ @ $T_C = 100^\circ\text{C}$ | 25A @ 100°C     |           |           | 30A @ 107°C     |           |           |
| RMS Forward Current, $I_F$ (RMS)                                       | 40A             |           |           | 50A             |           |           |
| Non-Repetitive Sinusoidal Surge Current (8.3ms), $I_{FSM}$             | 320A            |           |           | 500A            |           |           |
| Thermal Resistance, Junction to Case, $R_{\theta JC}$                  | 1.5°C/W         |           |           | 1.5°C/W         |           |           |
| Storage Temperature Range, $T_{STG}$                                   | -55°C to +150°C |           |           | -55°C to +150°C |           |           |
| Maximum Operating Junction Temperature, $T_{J MAX}$                    | +150°C          |           |           | +150°C          |           |           |

### ELECTRICAL SPECIFICATIONS

| Type                               | Maximum Reverse Voltage<br>$V_R$ | Maximum Forward Voltage<br>$V_F$ |                                                       | Maximum Reverse Current<br>$I_R$     |                           | Maximum Reverse Recovery Time<br>$t_{RR}$ |
|------------------------------------|----------------------------------|----------------------------------|-------------------------------------------------------|--------------------------------------|---------------------------|-------------------------------------------|
|                                    |                                  | $T_C = 25^\circ\text{C}$         | $T_C = 125^\circ\text{C}$                             | $T_C = 25^\circ\text{C}$             | $T_C = 125^\circ\text{C}$ |                                           |
| UES701<br>UES702<br>UES703         | 50V<br>100V<br>150V              | 0.95V<br>@<br>$I_F = 25\text{A}$ | 0.825V<br>@<br>$I_F = 25\text{A}$                     | 20 $\mu\text{A}$<br>@<br>Rated $V_R$ | 4mA<br>@<br>Rated $V_R$   | 35ns <sup>(1)</sup>                       |
|                                    |                                  | $T_C = 25^\circ\text{C}$         | $T_C = 100^\circ\text{C}$                             | $T_C = 25^\circ\text{C}$             | $T_C = 100^\circ\text{C}$ |                                           |
| BYW31-50<br>BYW31-100<br>BYW31-150 | 50V<br>100V<br>150V              | 1.3V<br>@<br>$I_F = 100\text{A}$ | 0.85V<br>@<br>$I_F = 20\text{A}$                      | 20 $\mu\text{A}$<br>@<br>Rated $V_R$ | 2.5mA<br>@<br>Rated $V_R$ | 50ns <sup>(2)</sup>                       |
|                                    |                                  | $T_C = 25^\circ\text{C}$         | $T_C = 100^\circ\text{C}$                             | $T_C = 25^\circ\text{C}$             | $T_C = 100^\circ\text{C}$ |                                           |
| BYW77-50<br>BYW77-100<br>BYW77-150 | 50V<br>100V<br>150V              | 1.1V<br>@<br>$I_F = 63\text{A}$  | $V_F$<br>$I_F$<br>0.75V 10A<br>0.85V 20A<br>1.2V 100A | 25 $\mu\text{A}$<br>@<br>Rated $V_R$ | 2.5mA<br>@<br>Rated $V_R$ | 50ns <sup>(2)</sup>                       |

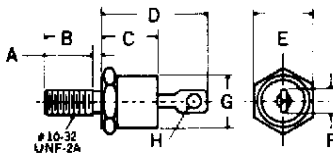
(1) Measured in circuit  $I_F = 0.5\text{A}$ ,  $I_R = 1\text{A}$ ,  $I_{RSC} = 0.25\text{A}$

(2) Measured in circuit  $I_F = 1\text{A}$  to  $V_R > 30\text{V}$   $dI_F/dt = 20\text{A}/\mu\text{s}$

**Microsemi Corp.**  
**Watertown**  
The diode experts

## MECHANICAL SPECIFICATIONS

### UES701 SERIES BYW31 SERIES BYW77 SERIES



|   | in.            | mm             |
|---|----------------|----------------|
| A | .078 MAX.      | 1.98 MAX.      |
| B | .437 ± .015    | 11.10 ± 0.38   |
| C | .405 MAX.      | 10.29 MAX.     |
| D | .800 MAX.      | 20.32 MAX.     |
| E | .430 ± .010    | 10.92 ± 0.25   |
| F | .250 MAX.      | 6.35 MAX.      |
| G | .424 MAX.      | 10.77 MAX.     |
| H | .065 MIN. DIA. | 1.68 MIN. DIA. |

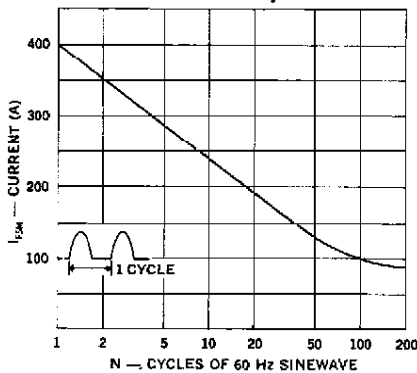
DO-4



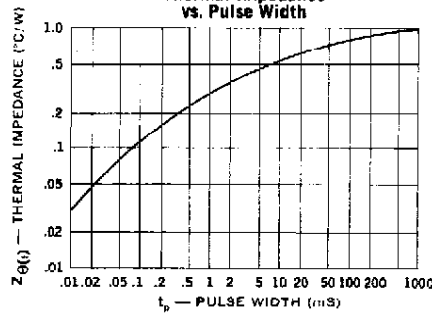
#### Notes:

1. Cathode is stud.
2. All metal surfaces tin plated.
3. Maximum unlubricated stud torque: 10 inch pounds.
4. Angular Orientation of terminal is undefined.

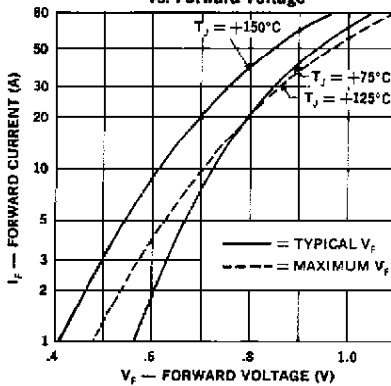
Maximum Forward Surge  
vs. Number of Cycles



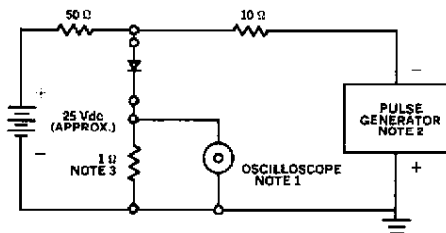
Thermal Impedance  
vs. Pulse Width



Forward Current  
vs. Forward Voltage



Reverse-Recovery Circuit



#### NOTES:

1. Oscilloscope: Rise time ≤ 3ns; input impedance = 50Ω.
2. Pulse Generator: Rise time < 8ns; source impedance 100.
3. Current viewing resistor, non-inductive, coaxial recommended.

UES701 BYW31-50 BYW77-50  
UES702 BYW31-100 BYW77-100  
UES703 BYW31-150 BYW77-150

